

| | | |
|-----------|-----------|----------|
| APPROVED | O.G. FIG. | |
| BY | CLASS | SUBCLASS |
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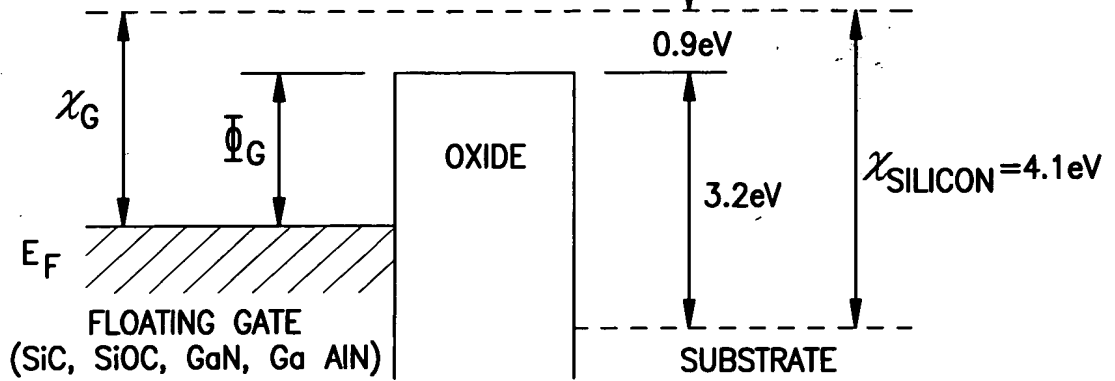


FIG. 1A
(PRIOR ART)

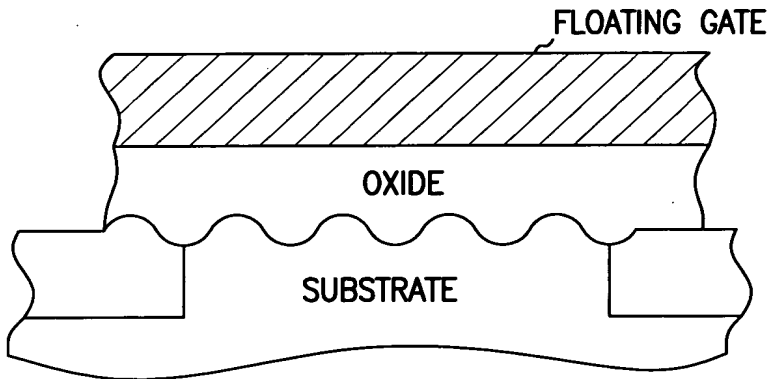


FIG. 1B
(PRIOR ART)

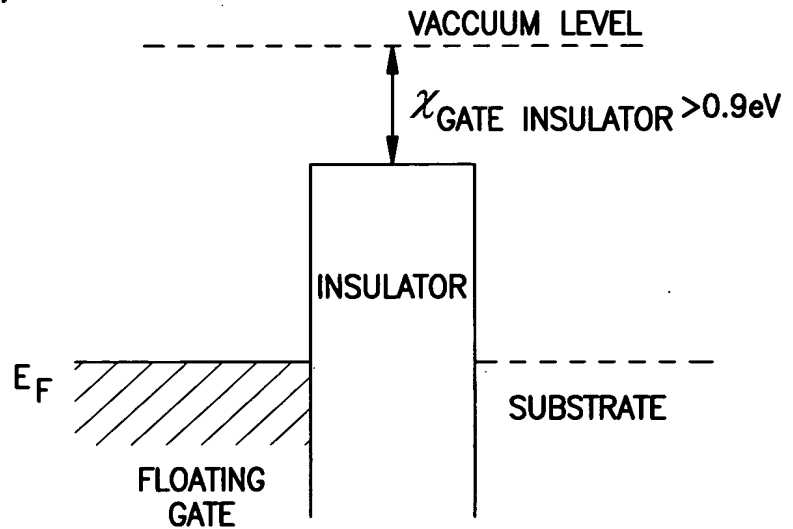


FIG. 1C
(PRIOR ART)

10028001.122001



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FOOZET" FOOE200T

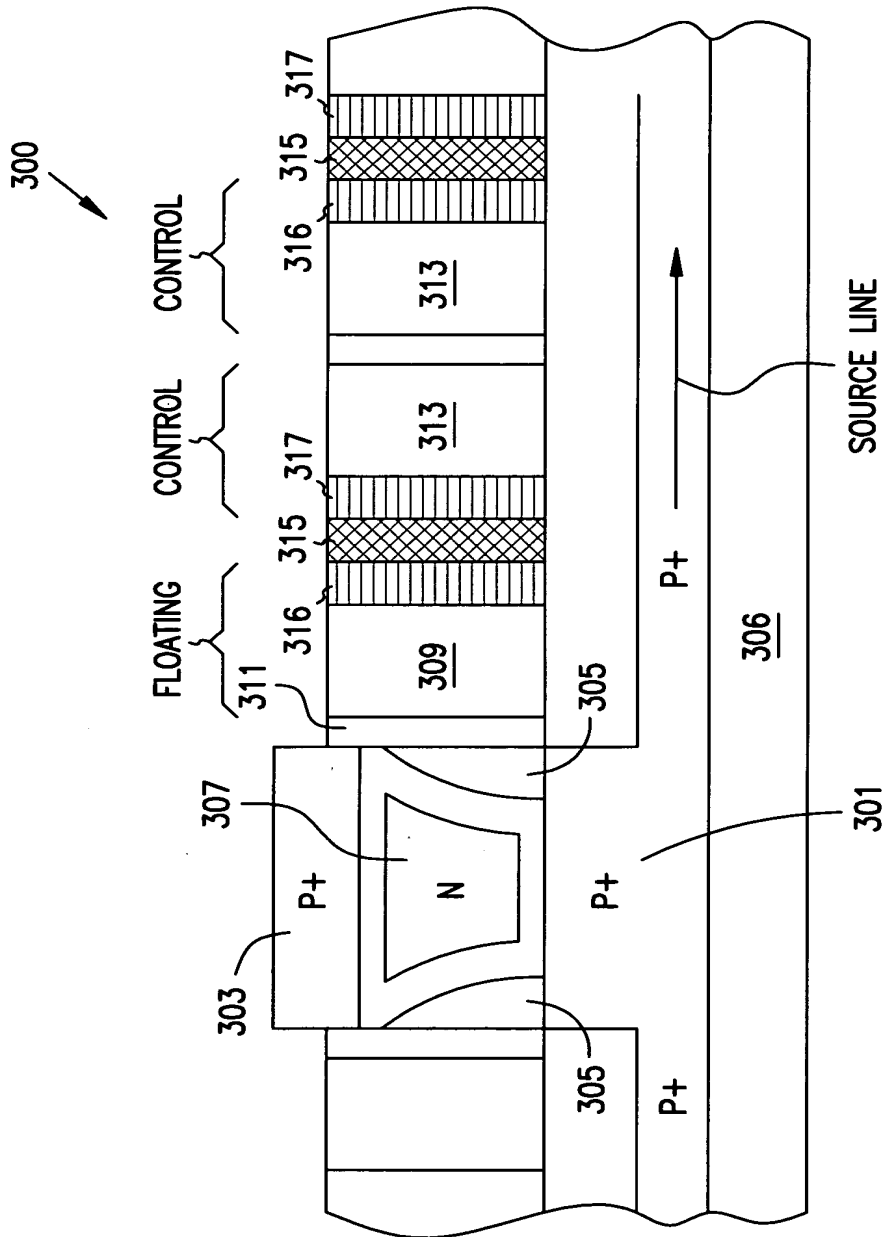


FIG. 3

| | | |
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| APPROVED | O.G. FIG. | |
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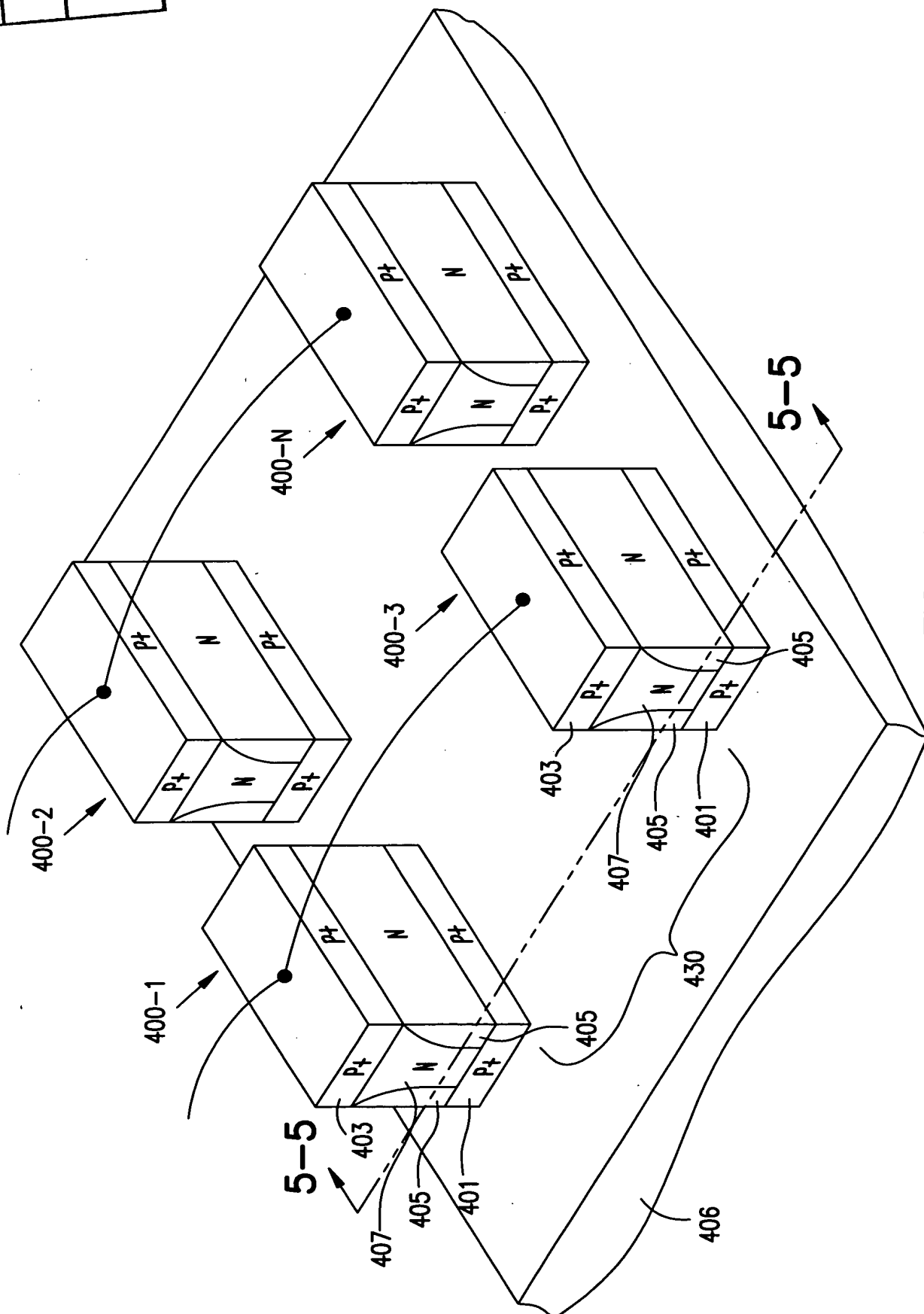


FIG. 4

FOO222T" T008200T

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| APPROVED | O.G. FIG. | |
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| DRAFTSMAN | | |

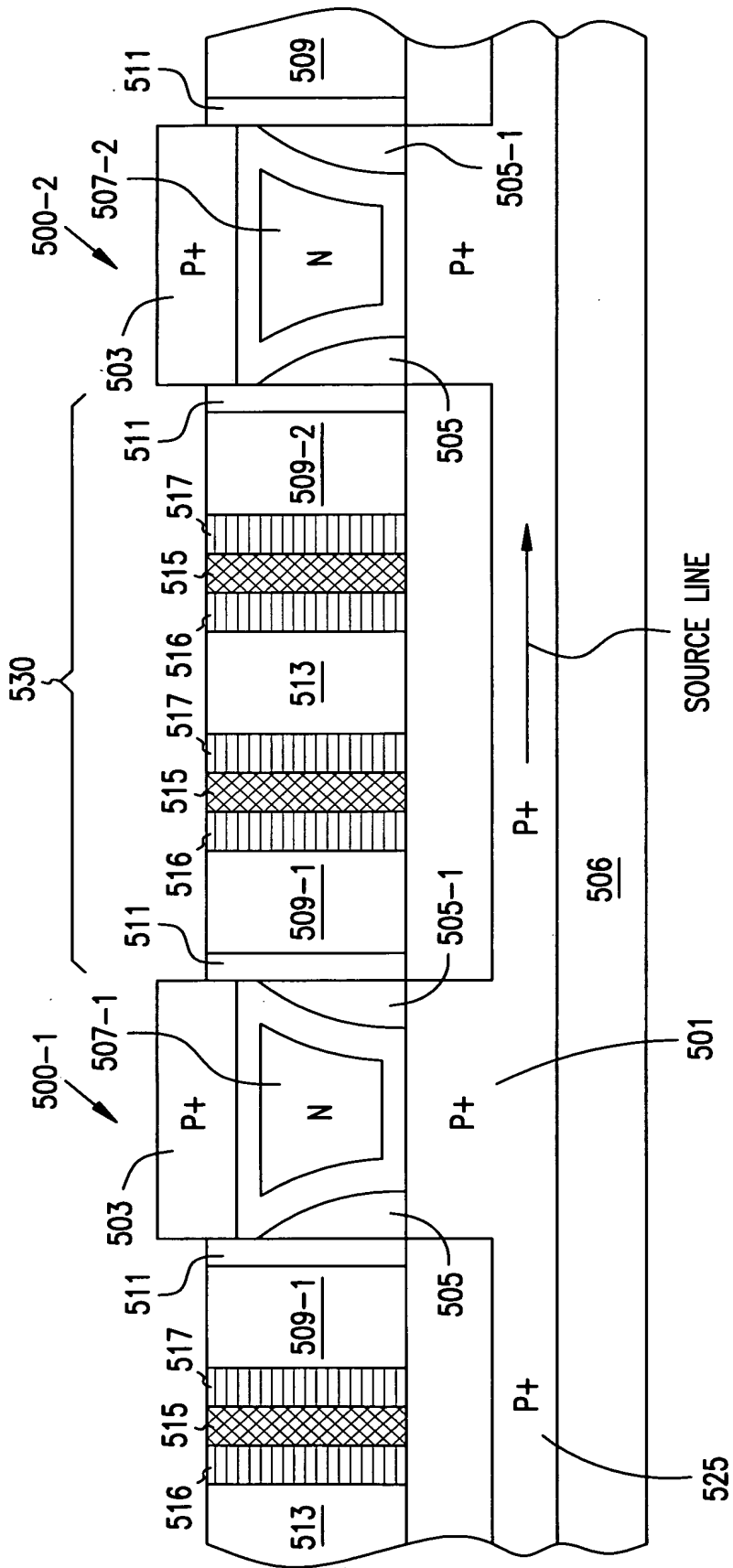


FIG. 5A

| | | |
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| DRAFTSMAN | | |

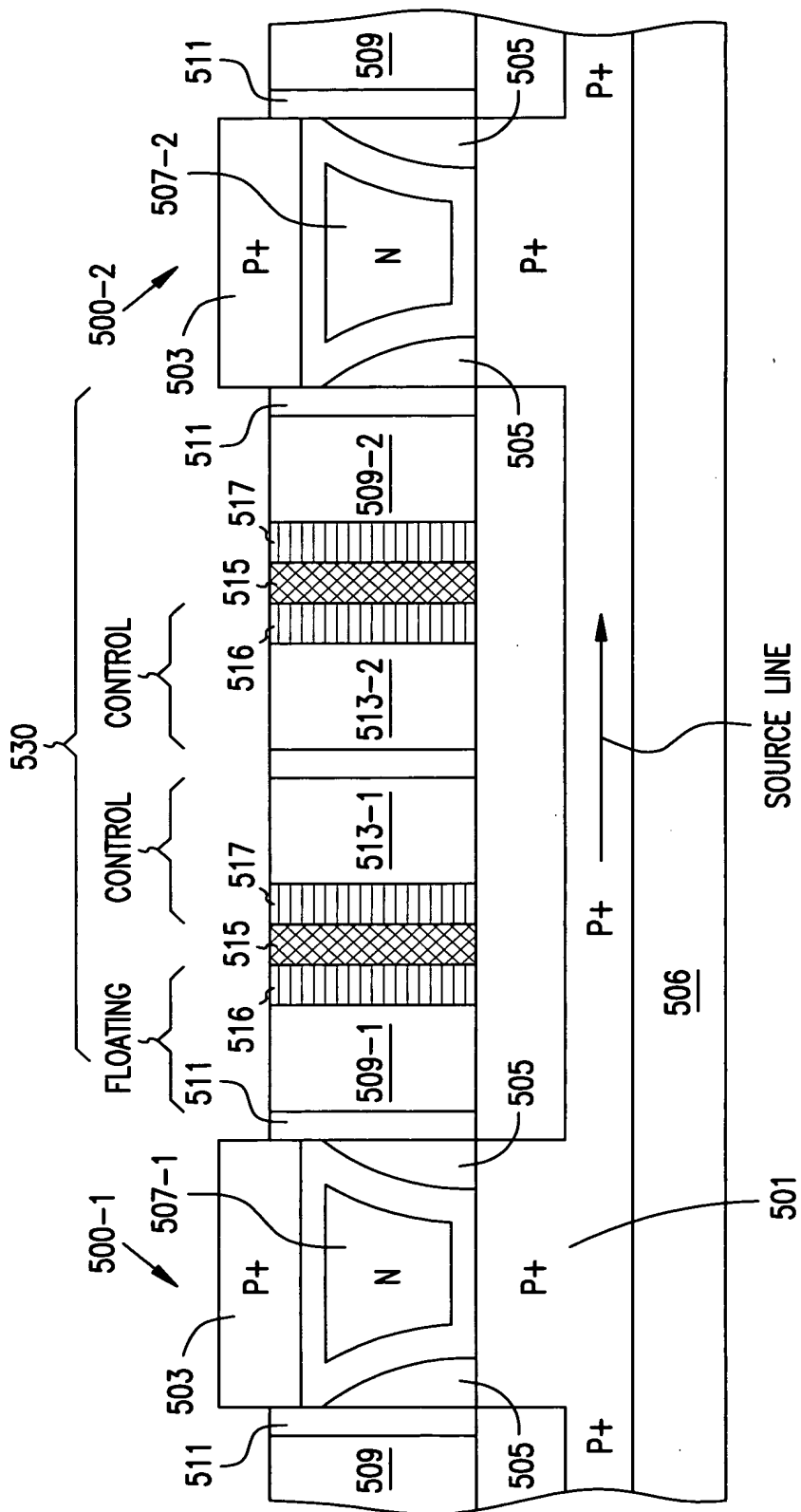


FIG. 5B

| | |
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| APPROVED | O.G. FIG. |
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FIG. 5C

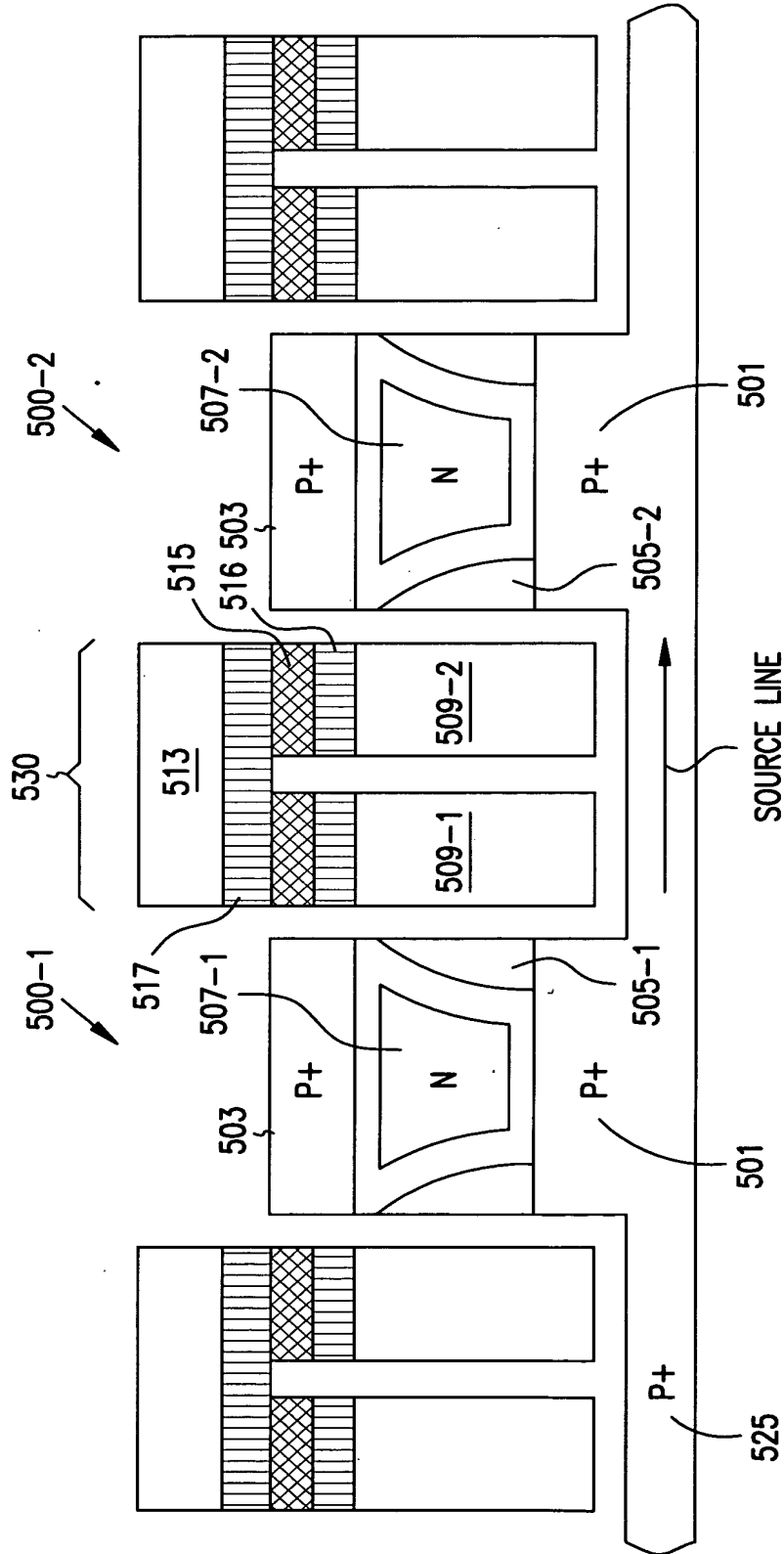


FIG. 5C

INVENTORS NAME: Leonard Forbes et al.
DOCKET NO.: 1303.035US1

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| APPROVED | O.G. F.B.I. |
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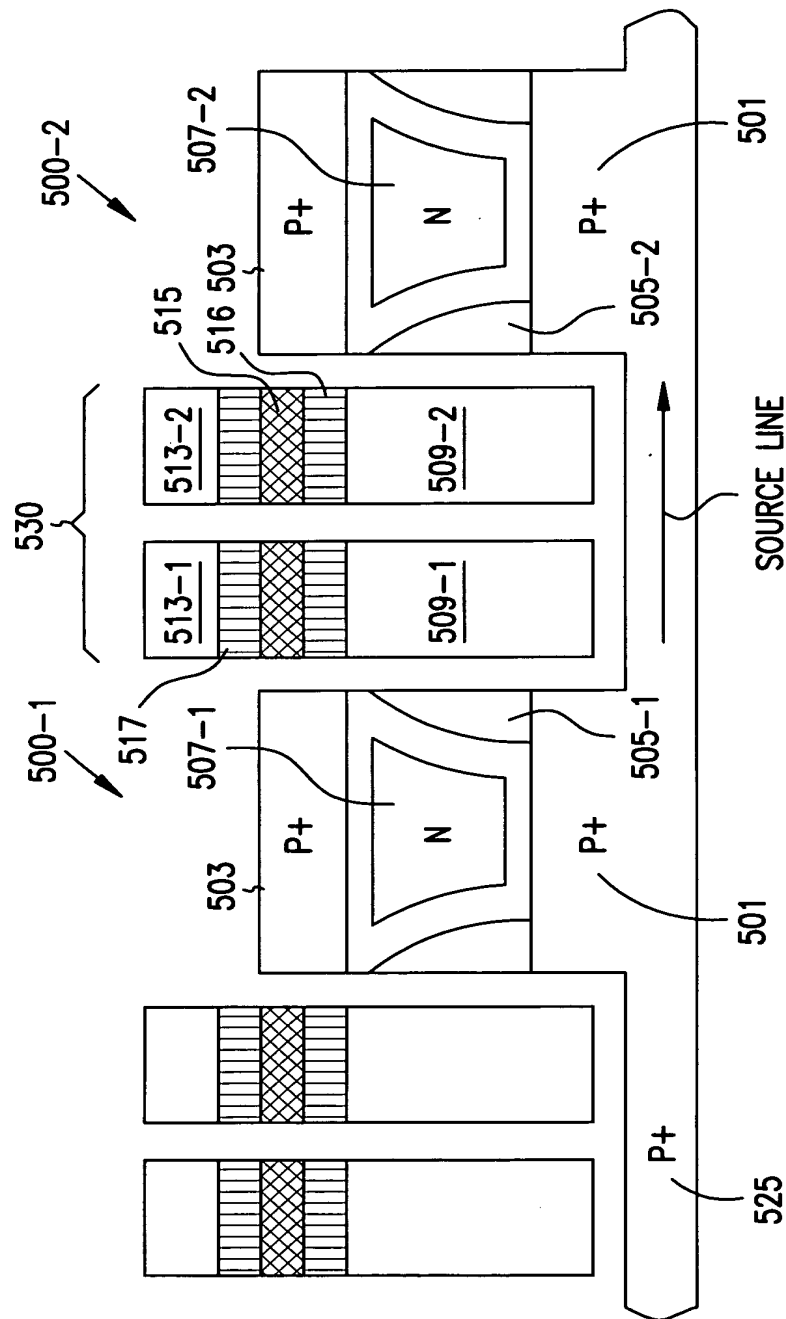


FIG. 5D

[illegible]

| | | |
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| APPROVED | O.G. FIG. | |
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FORBES

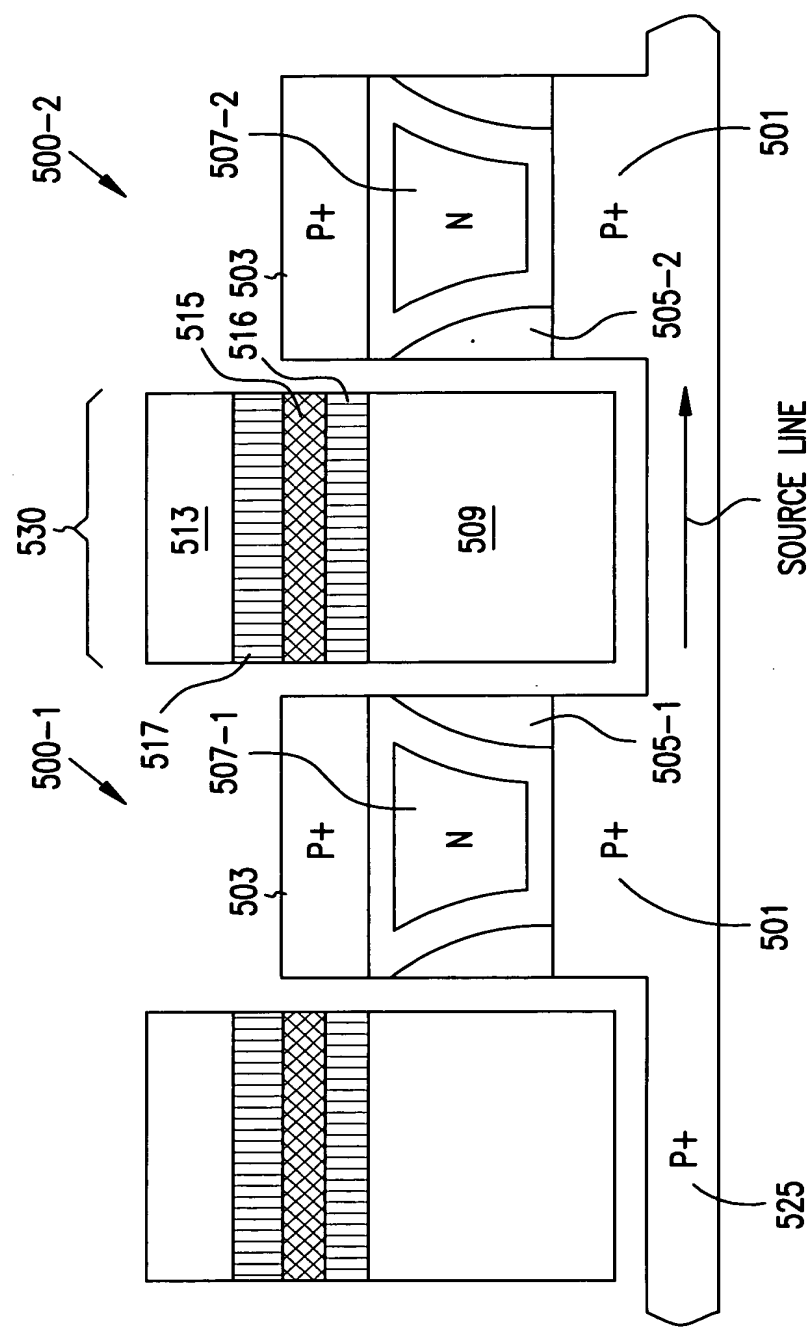


FIG. 5E

| | | |
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| APPROVED | O.G. FIG. | |
| BY | CLASS | SUBCLASS |
| DRAFTSMAN | | |

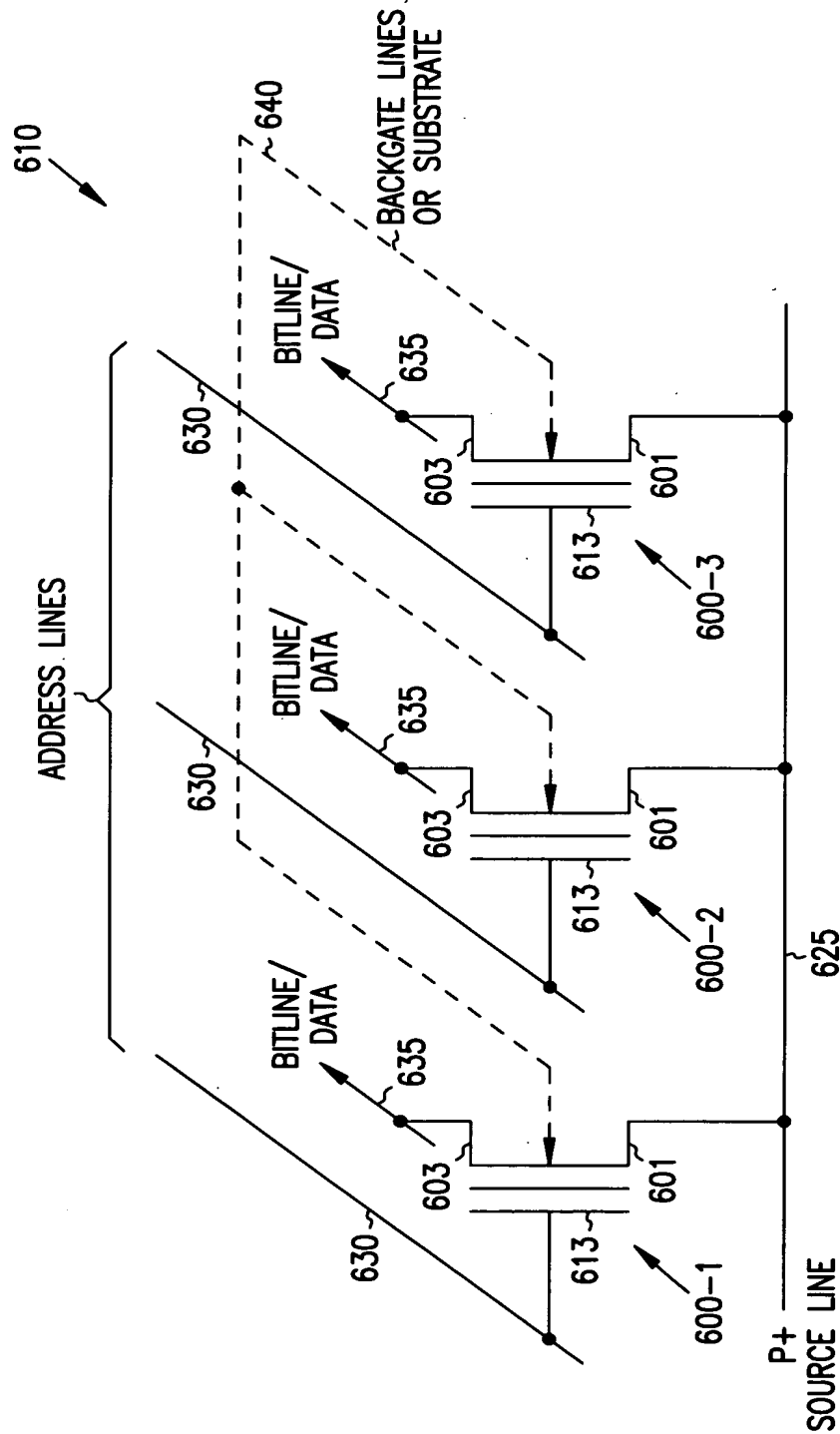


FIG. 6A

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| APPROVED | O.G. FIG. | |
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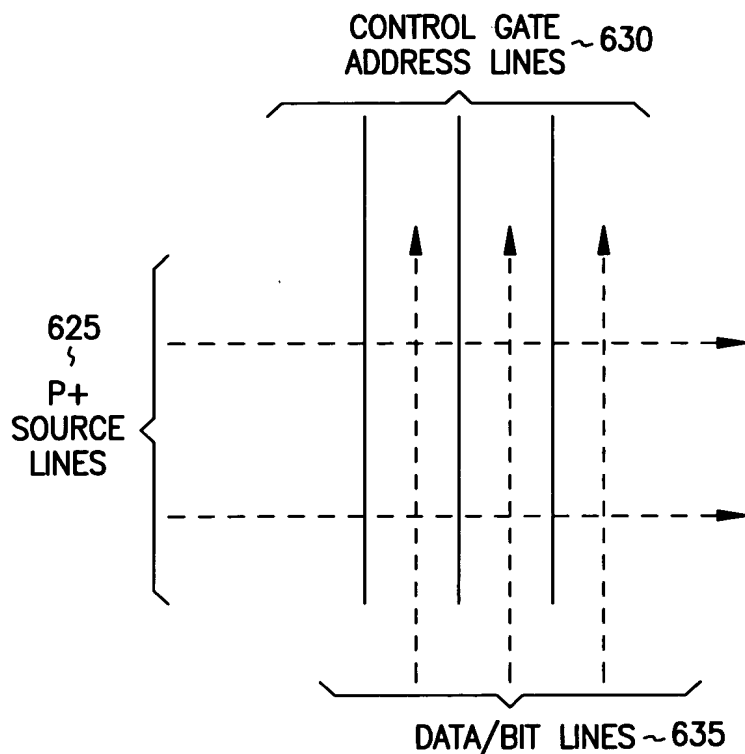


FIG. 6B

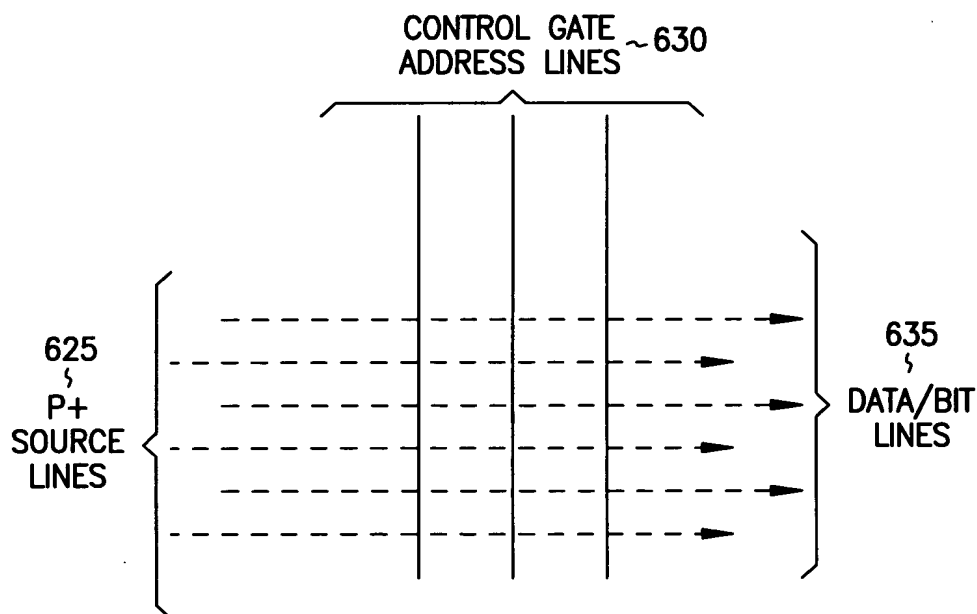


FIG. 6C

10028001-122001

TITLE: PROGRAMMABLE ARRAY LOGIC OR MEMORY WITH P-CHANNEL DEVICES AND
ASYMMETRICAL TUNNEL BARRIERS

INVENTORS NAME: Leonard Forbes et al.

DOCKET NO.: 1303.035US1

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| APPROVED | O.G. FIG. |
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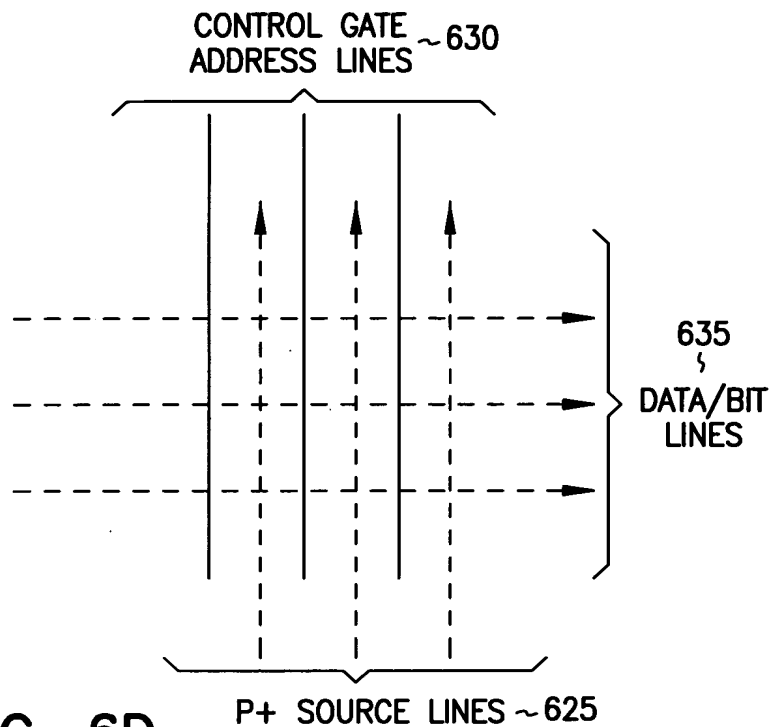


FIG. 6D

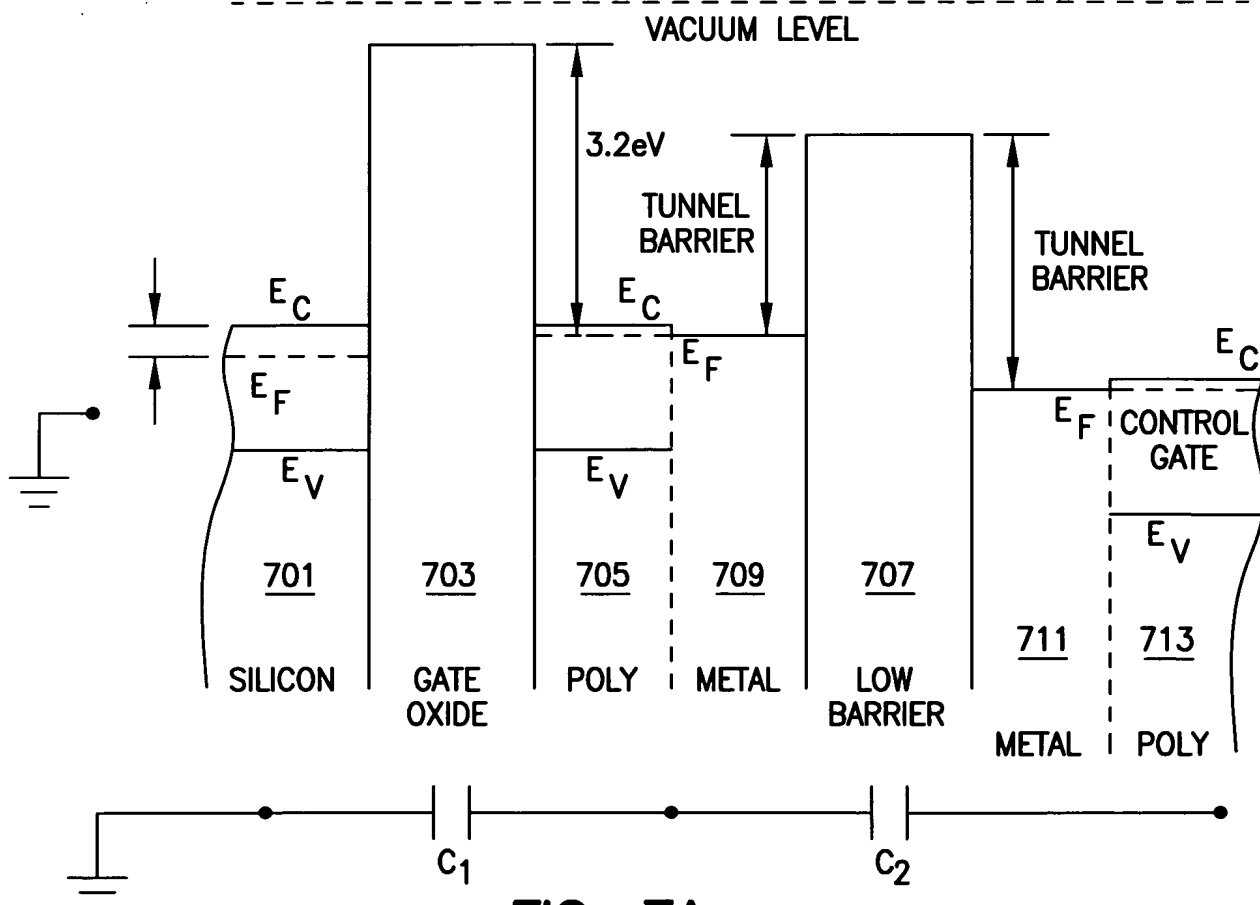
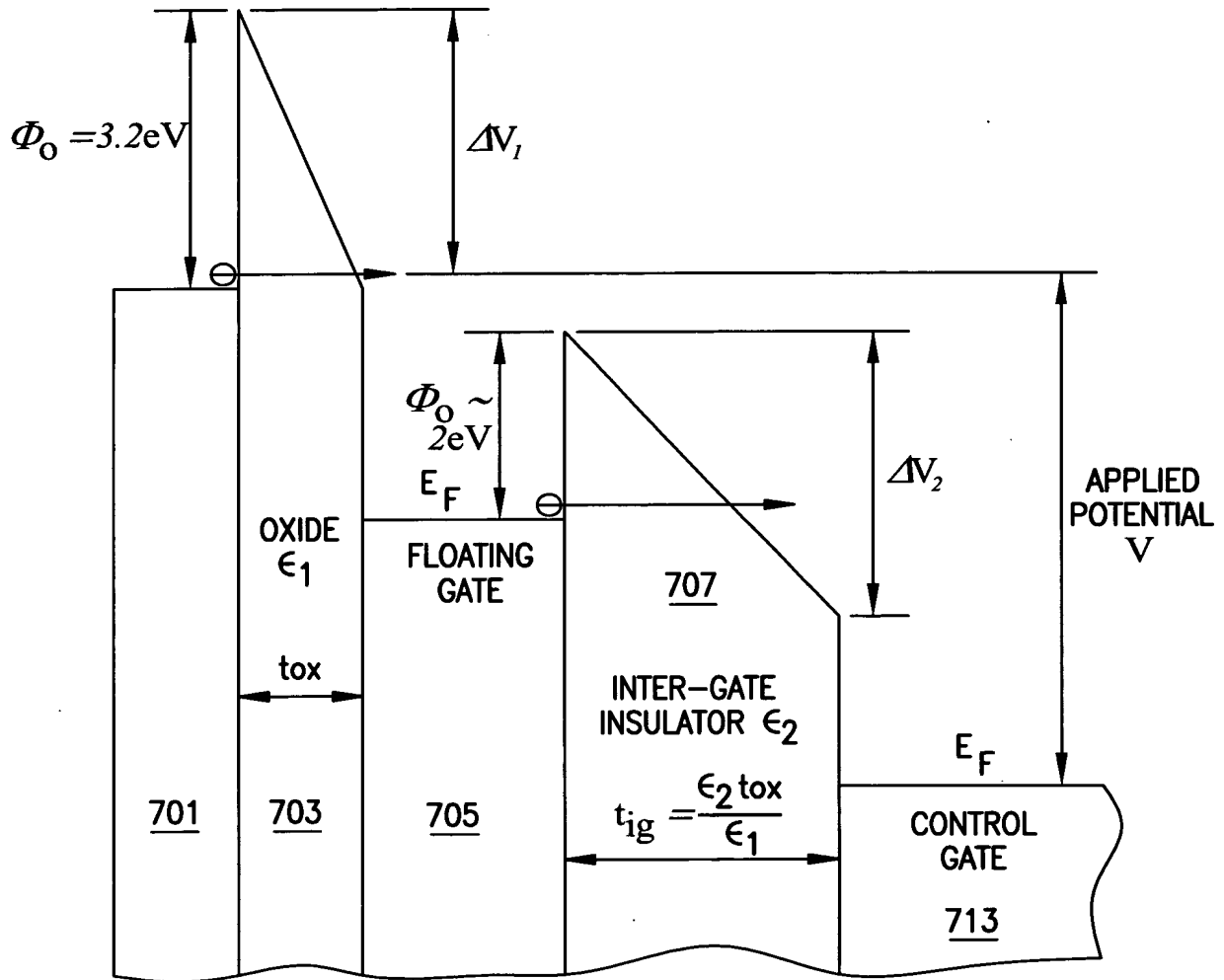


FIG. 7A

10028001-12001

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| APPROVED | O.G. FIG. |
| BY | CLASS SUBCLASS |
| DRAFTSMAN | |



$$J = \frac{q^2 E^2}{4\pi h \Phi} e^{-E_0/E} \quad E_0 = \frac{8\pi}{3} \frac{\sqrt{2mq}}{h} \Phi^{3/2}$$

FIG. 7B

| | | |
|-----------|-----------|----------|
| APPROVED | J.G. FIG. | |
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TITLE: PROGRAMMABLE ARRAY LOGIC OR MEMORY WITH P-CHANNEL DEVICES AND ASYMMETRICAL TUNNEL BARRIERS

INVENTORS NAME: Leonard Forbes et al.

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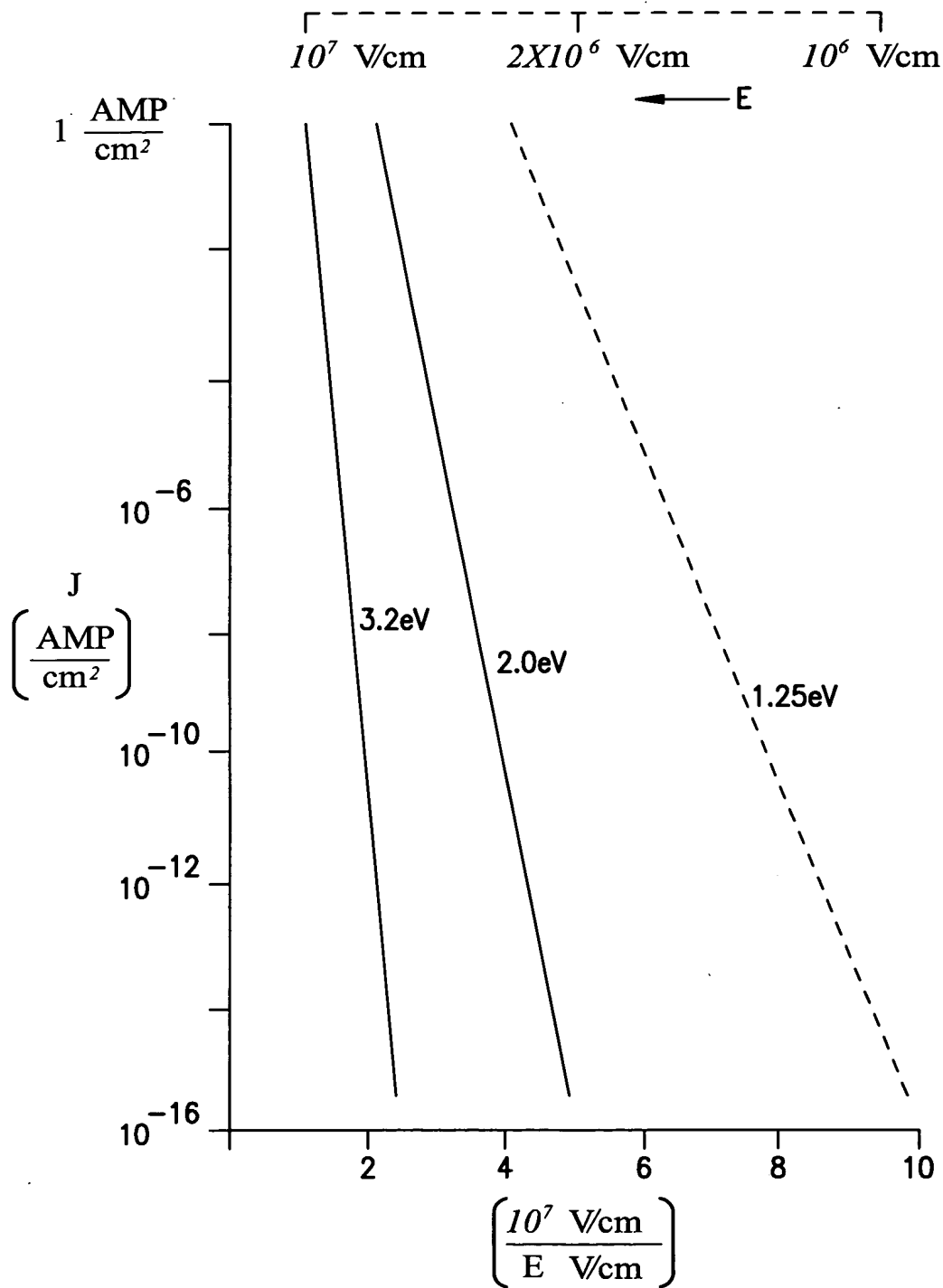


FIG. 7C

10028001-12001

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| APPROVED | O.G. FIG. | |
| BY | CLASS | SUBCLASS |
| DRAFTSMAN | | |

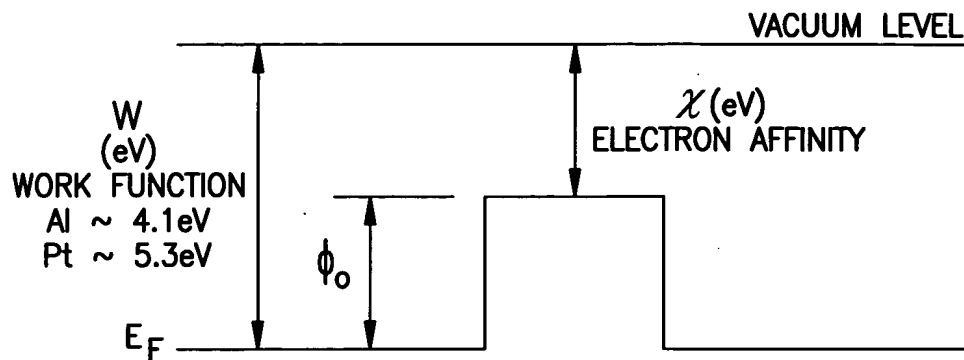


FIG. 8

| | E_g | ϵ_r | ϵ_∞ | χ | ϕ_0 (Pt) | ϕ_0 (Al) | ϕ_0 (Other) |
|--|-----------|--------------|-------------------|--------|---------------|---------------|------------------|
| <u>Conventional Insulators</u> | | | | | | | |
| SiO ₂ | ~ 8 | 4 | 2.25 | 0.9 | | 3.2 | 4.0 (Si) |
| Si ₃ N ₄ | ~ 5 | 7.5 | 3.8 | 1.7 | | 2.4 | |
| <u>Metal Oxides</u> | | | | | | | |
| Al ₂ O ₃ | 7.6 | 9 - 11 | 3.4 | 2.1 | | ~ 2 | |
| NiO | | | | | | | |
| <u>Transition Metal Oxides</u> | | | | | | | |
| Ta ₂ O ₅ | 4.6 - 4.8 | | 4.8 | 3.3 | 2.0 | 0.8 | 1.0 (Ta) |
| TiO ₂ | 6.8 80 | 30- | 7.8 | 3.9 | ~ 1.2 | 0.2 | 0.4 (Ti) |
| ZrO ₂ | 5 - 7.8 | 18.5 25 | 4.8 | 2.5 | | 1.4 | 2.7 (Zr) |
| Nb ₂ O ₅ | 3.1 | 35-50 | | | | | |
| Y ₂ O ₃ | 6 | | 4.4 | 1.8 | | 2.3 | 1.3 (Y) |
| <u>Perovskite Oxides</u> | | | | | | | |
| SrBi ₂ Ta ₂ O ₃ | 4.1 | | 5.3 | 3.3 | 2.0 | 0.8 | |
| SrTiO ₃ | 3.3 | | 6.1 | 3.9 | 1.4 | 0.2 | |
| PbTiO ₃ | 3.4 | | 6.25 | 3.5 | 1.8 | 0.6 | |
| PbZrO ₃ | 3.7 | | 4.8 | 3.9 | ~1.4 | 0.2 | |

FIG. 9

DOCKET# 1303.035US1

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| APPROVED | O.T. FIG. PROGRAMMABLE | |
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ARRAY LOGIC OR MEMORY WITH P-CHANNEL DEVICES AND
ASYMMETRICAL TUNNEL BARRIERS

INVENTORS NAME: Leonard Forbes et al.

DOCKET NO.: 1303.035US1

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| Metal | Oxygen Solub.**, at. % | Oxide Stability Range*** | Semicond. Type | Structure Temp. | Transform Temp., °C |
|-------|------------------------------|--|-------------------|--------------------|------------------------|
| Ta | 0.8 | TaO _{4.7-5.0} | n | Orthorhom. | t.p. 1350 |
| Ti | 28 | TiO _{3.82-5.0} | n | Rutile | m.p. 1920 |
| Zr | 29 | ZrO _{3.66-5.0} | n | Monoclinic | t.p. 1170 |
| Nb | 2.3 | Nb ₂ O _{4.86-5.0} | n | Monoclinic | m.p. 1495 |
| Al | v. small | Al ₂ O _{2.999-3.0} | n | Corundum | m.p. 2050 |
| Pb | v. small | PbO | (p) | Orthorhom. | m.p. 885 |
| Si | v. small | SiO ₂ | n or p | Tetra. (Cyst.) | m.p. 1713 |

FIG. 10

| Metal | Orientation | Work Function, eV |
|-------|---------------|-------------------|
| Eu | Polycryst. | 2.5 |
| Sm | " | 2.7 |
| Y | " | 3.1 |
| Al | (111) | 4.26 |
| Cu | (111) | 4.94 |
| Au | (111) | 5.31 |
| Ti | Polycryst. | 4.33 |
| Rh | " | 4.98 |
| Pt | " | 5.64 |
| Zr | " | 4.05 |
| Ta | " | 4.25 |
| Nb | " | 4.36 |
| Si | (100), n-type | 4.91 |

FIG. 11

10028001-122001

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| APPROVED | O.G. FIG. |
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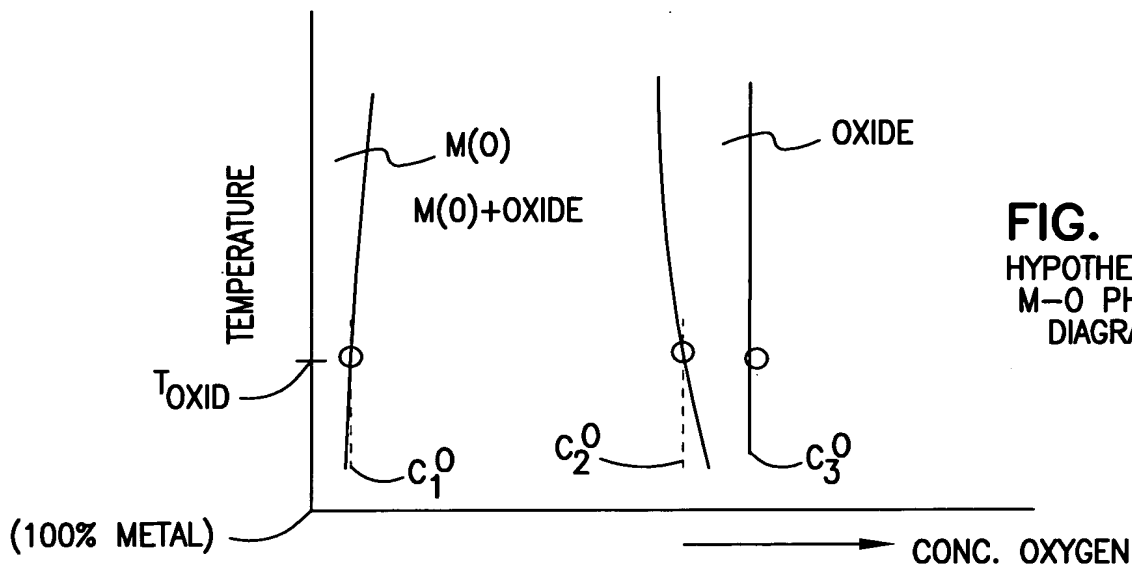
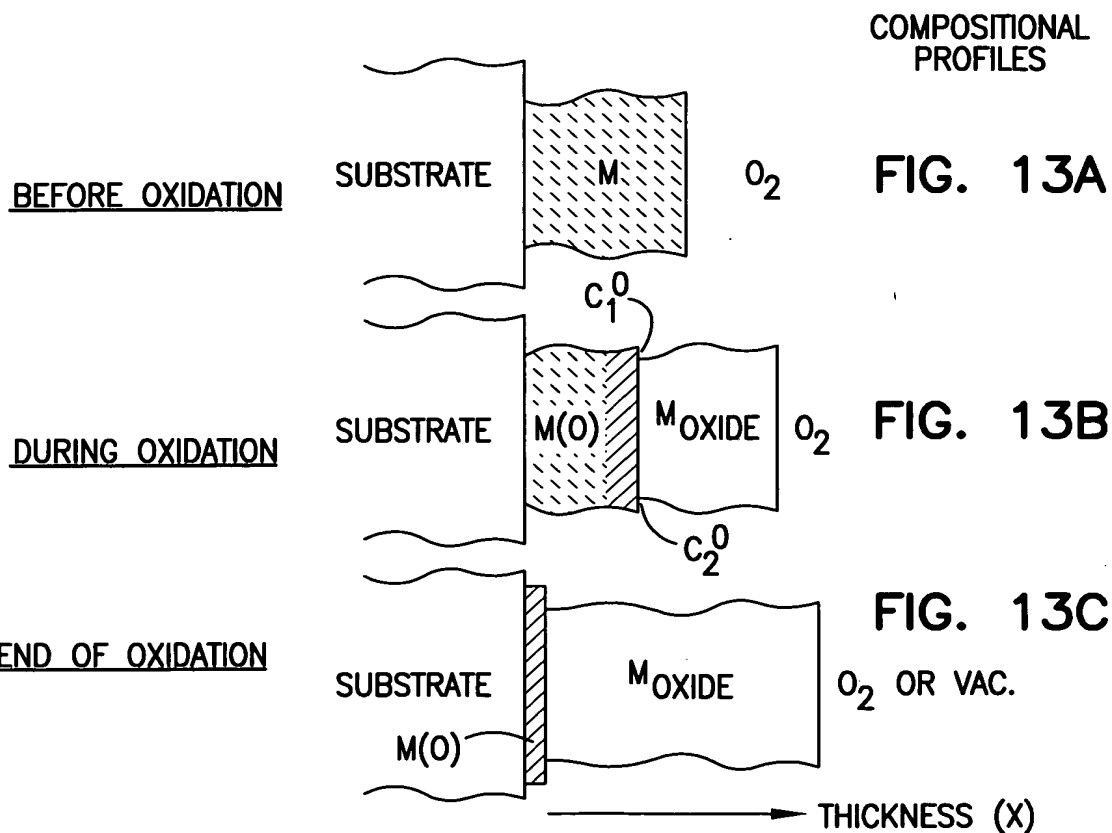


FIG. 12
HYPOTHETICAL
M-O PHASE
DIAGRAM



COMPOSITIONAL
PROFILES

FIG. 13A

FIG. 13B

FIG. 13C

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| APPROVED | O.G. FIG. |
| BY | CLASS SUBCLASS |
| DRAFTSMAN | |

FOOTNOTES

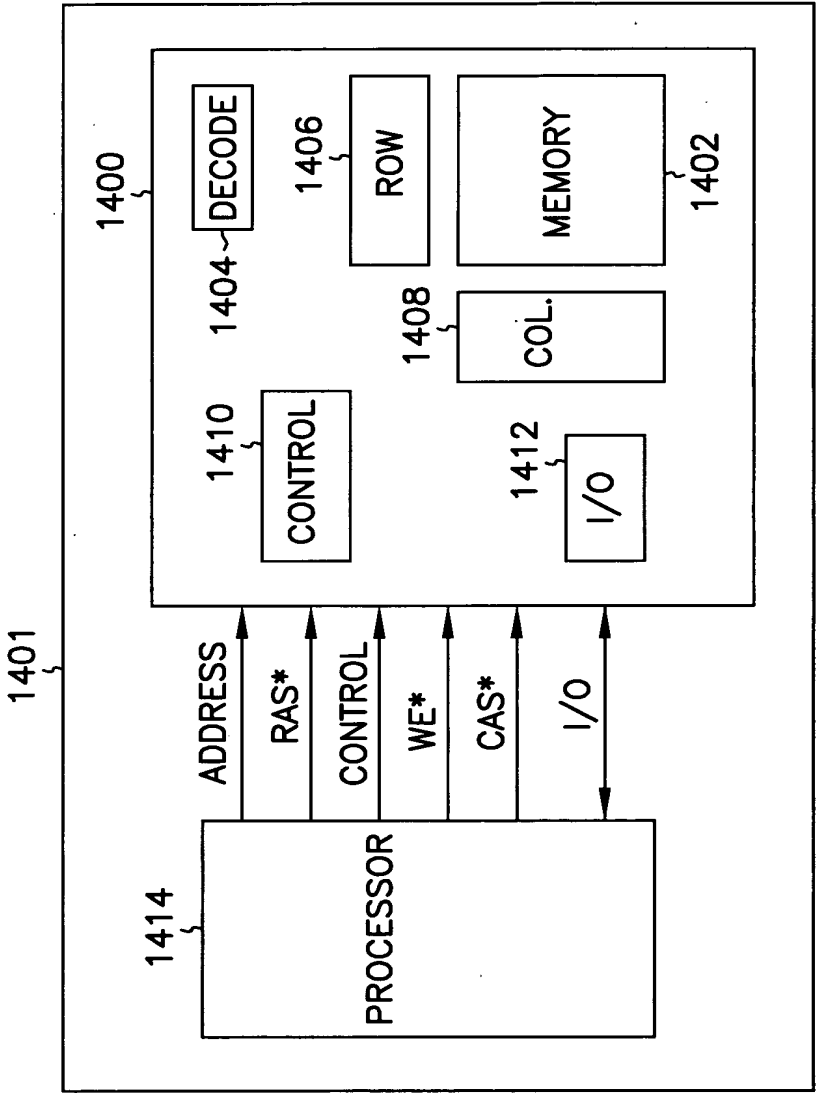


FIG. 14